case assembly **12** is hung or supported from the bearing support assembly **18**.

The tie rods **20** have inner threaded ends **60** fixedly attached to the bearing support assembly **18** and outer threaded ends **62** fixedly attached to the engine mount structure **22**. Each tie rod passes through one of the struts **48** and carries the loads from the bearing support assembly **18** to the engine mount structure **22**. In this embodiment the engine mount structure **22** is a part of a fan bypass duct assembly **66** which defines an annular fan bypass flow path **68** between itself and the outer case **44**. Although unrelated to the present invention, a bearing oil feed tube **70** is also shown passing through a strut **48**.

The fairing **46** has an upstream end **72**, a downstream end **74**, and a sheet metal wall **76** extending therebetween. The wall **76** and the outer case **44** define the gas flow path **28** downstream of the turbine exit guide vanes **50**. As shown in the drawing, the downstream end **74** of the fairing **46** is cantilever supported from the inner case **42** downstream of the struts **48**. The wall **76** has holes **78** therethrough the shape of the struts **48** and through which the struts pass. As best shown in FIG. **2**, the wall **76** includes axial corrugations **80** therein along the axial length of the struts **48**. The corrugations are mainly for the purpose of reducing vibrations in the fairing **46** during engine operation. The upstream end **72** of the fairing **46** includes a support ring **82** having a substantial cross-sectional area for providing stiffness to the thin, sheet metal wall **76**.

As best shown in FIG. **3** the exit guide vanes **50** in this embodiment are virtually flat plates (i.e., nonairfoil shaped) for the purpose of straightening the flow of gases exiting from between the turbine blades **26**. Due to the fact that in this embodiment there is virtually no pressure drop across the vanes **50**, and because the surface area of the vanes acted on by the down-stream pressure is greater than the surface areas acted on by the upstream pressure, the vanes are constantly pressure loaded in the upstream direction during engine operation. The vanes **50** include radially inner ends **84** including inner platforms **86**, and radially outer ends **88** including outer platforms **90**. The vanes **50** are attached to the outer case **44** at their outer ends **88** near their forward edges **92**. The platforms **90** include outwardly extending and circumferentially abutting flange portion **94** having forwardly extending lips **96**. These lips fit within a rearwardly facing annular slot **98** in a vane support ring **100**. The ring has a radially outwardly extending annular plate portion **102** trapped between a radially outwardly extending flange **104** of a forward outer case portion **106** and a radially outwardly extending flange **108** of a rear outer case portion **110**. The flanges **104, 108** are secured together by bolts **112**. Radially inwardly extending circumferentially spaced apart annular lip segments **114** on the rear outer case portion **110** just down-stream of each flange portion **94** prevent axial movement of the outer ends of the vanes **50**. This hook-type arrangement at the upstream ends of the platforms **90**, coupled with a small radial gap **116** between the downstream ends of the platforms **90** and the outer case **44**, permits a significant amount of rocking of the vanes **50** in an upstream and downstream direction about their point of attachment to the outer case **44**. The vanes **50** may be individual vanes, each with their own platforms **86, 90**; or they may be clusters of two or more vanes which share common platforms.

The upstream ends of the inner platforms **86** of the vanes **50** include inwardly extending and circumferentially abutting tangs **118** which, taken together, form an annular segmented ring. These tangs fit within an annular radially outwardly facing channel **120** formed in the support ring **82** of the fairing **46** and are free to move radially relative thereto. During engine operation the vanes **50** are pressure loaded in the upstream direction such that the tangs **118** are forced against the rearwardly facing surface **122** of the channel **120**. The axial width of the channel **120** is wider than the thickness of the tangs **118** such that the vanes can rock in the upstream and downstream direction without the possibility of putting any twisting moments into the fairing **46**.

In addition to providing a lightweight, structurally sound turbine exit vane support system, the turbine exhaust case assembly of the present invention provides a good heat shield for the bearing **16** and bearing support structure **18** in that the only leakage path for the hot gas stream is through gaps between the fairing wall **76** and the struts **48**, and gaps between adjacent tangs **118**.

Although the invention has been shown and described with respect to a preferred embodiment thereof, it should be understood by those skilled in the art that other various changes and omissions in the form and detail thereof may be made therein without departing from the spirit and the scope of the invention.

We claim:

1. In an axial flow gas turbine engine including a turbine section comprising at least one turbine rotor stage, a turbine exhaust case assembly disposed downstream from said rotor stage and including means defining an axially extending annular gas flow path, the exhaust case assembly comprising:

inner case means;

outer case means spaced radially outwardly from said inner case means;

a stage of turbine exit guide vanes disposed in said gas flow path for straightening the flow of gases exiting said turbine rotor stage, said guide vanes having radially outer ends attached to said outer case means in a manner permitting rocking of said vanes in an upstream and downstream direction about the point at which they are attached to said outer case means;

a plurality of circumferentially disposed struts extending radially across the flow path downstream of said guide vanes and having inner ends fixedly attached to said inner case means and outer ends fixedly attached to said outer case means; and

fairing means having an upstream end and downstream end, said fairing means including sheet metal wall means having an upstream end, said wall means being disposed between said inner case means and outer case means defining the radially inner surface of said annular gas flow path immediately downstream of said exit guide vanes, said fairing means being cantilever supported from its downstream end from said inner case means downstream of said struts, each of said struts passing through an opening in said wall means, said upstream end of said fairing means engaging said inner ends of said exit guide vanes to provide axial support for said guide vanes, said fairing means comprising a support ring integral with said upstream end of said sheet metal wall means, said support ring providing stiffness to said wall means